Listeriosis

1. DISEASE REPORTING

A. Purpose of Reporting and Surveillance

1. To identify sources of transmission (e.g., a commercial product) and to prevent further disease transmission from such sources.
2. To collect data that will help investigate an outbreak should cases be part of an outbreak.
3. To better characterize the epidemiology of this organism.

B. Legal Reporting Requirements

1. Health care providers: **immediately notifiable to local health jurisdiction.**
2. Hospitals: **immediately notifiable to local health jurisdiction**.
3. Laboratories: notifiable to local health jurisdiction within 2 work days; specimen submission is not required.
4. Local health jurisdiction: notifiable to the Washington State Department of Health (DOH) Communicable Disease Epidemiology Section (CDES) within 7 days of case investigation completion or summary information required within 21 days.

C. Local Health Jurisdiction Investigation Responsibilities

1. Although laboratories are not legally required to submit specimens, encourage them to submit *L. monocytogenes* isolates to PHL to assist with outbreak detection.
2. Report all *confirmed* cases to CDES. Complete the listeriosis case report form (www.doh.wa.gov/notify/forms/listeriosis.doc) and enter the data into the Public Health Issues Management System (PHIMS).

2. THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Listeria monocytogenes are gram-positive rods that cause infection primarily in pregnant women, newborns, the elderly, and immunocompromised persons**,** though both sporadic cases and outbreaks have occurred among immunocompetent persons.

B. Description of Illness

The presentation of listeriosis depends on the host. Immunocompromised, neonatal, and elderly persons often present with sepsis and meningitis. In pregnant women, listeriosis often manifests as a flu-like illness (i.e., fever, headache, muscle aches) and may cause miscarriages, pre-term births, or still-births. Immunocompetent persons often present with an acute febrile gastroenteritis.

The case fatality rate for invasive listeriosis is high; 30–50% of infants infected prenatally and 63% of adults over 60. Most cases of listeriosis are sporadic. However, outbreaks associated with consumption of contaminated foods have occurred.

C. Listeriosis in Washington State

DOH has received 10 to 15 reports of listeriosis per year during recent years.

D. Reservoirs

L. monocytogenes are common in the environment. The organism is easily recovered from soil, water, sewage, vegetation, silage, commercial meat, and dairy products. Domestic and wild mammals, birds, and man may be asymptomatic carriers of *Listeria* in their intestinal flora. Up to 10% of humans may be excreting *L. monocytogenes* in their stools at any given time, although person to person transmission is rare.

E. Modes of transmission

Listeriosis is primarily a foodborne infection. Consumption of contaminated food items has been identified as the source of infection in both sporadic and outbreak-associated cases. *Listeria* can be found in a variety of foods, including soft cheeses (especially Brie, Mexican–style cheeses, Camembert, Roquefort, Bleu), hot dogs and other ready to eat meats, smoked fish, lettuce, coleslaw and other salad items, ready-to-eat foods purchased from store delicatessens, and in raw milk. Cross-contamination of ready-to-eat foods may also play a role in transmission. *Listeria* contamination is a common cause for food product recalls.

Women who are infected during pregnancy may pass *L. monocytogenes* to the fetus, either transplacentally or at birth. Infection in the fetus may result in preterm delivery or stillbirth, while infection in the neonate may present as meningitis or septicemia. Transmission in neonatal nurseries, presumably on the hands of medical/nursing staff, has been documented.

F. Incubation period

The incubation period is not known with certainty but probably ranges from 3–70 days with an estimated median incubation period of 3 weeks.

G. Period of communicability

Person-to-person transmission, other than from mother to fetus or newborn, is rare. Mothers of infected newborns can shed the agent in vaginal discharges and urine for 7–10 days after delivery.

H. Treatment

The optimal antibiotic therapy for listeriosis has not been established in controlled trials. A combination of ampicillin and an aminoglycoside (gentamicin) is usually used for severe infections. Trimethoprim-sulfamethoxazole may be used in treating the patient who is allergic to penicillin.

3. CASE DEFINITIONS

A. Clinical Criteria for Diagnosis

In adults, invasive disease caused by *Listeria monocytogenes* manifests most commonly as meningitis or bacteremia; infection during pregnancy may result in fetal loss through miscarriage or stillbirth, or neonatal meningitis or bacteremia. Other manifestations can also be observed.

B. Laboratory Criteria for Diagnosis

1. Isolation of *L. monocytogenes* from a normally sterile site (e.g., blood or cerebrospinal fluid [CSF] or, less commonly, joint, pleural, or pericardial fluid).

2. In the setting of miscarriage or stillbirth, isolation of *L. monocytogenes* from placental or fetal tissue.

C. Case Definition (1999)

Confirmed: a clinically compatible case that is laboratory confirmed.

Note: The usefulness of other laboratory methods such as fluorescent antibody testing or polymerase chain reaction to diagnose invasive listeriosis has not been established.

4. DIAGNOSIS AND LABORATORY SERVICES

A. Diagnosis

The diagnosis of listeriosis is most commonly made by isolation of *L. monocytogenes* from a normally sterile site. Serologic testing is not useful in diagnosing acute invasive disease, but can be useful in detecting noninvasive disease (asymptomatic disease, gastroenteritis) in an outbreak setting. Stool testing is not commercially available.

B. Tests Available at DOH Public Health Laboratories (PHL)

Laboratories are not required to submit specimens to PHL. However, laboratories should be encouraged to forward isolates to the PHL to assist with outbreak detection. PHL will perform pulsed field gel electrophoresis (PFGE) analysis on all submitted isolates. In addition, PHL can provide isolate confirmation for *L. monocytogenes* if needed. Consult CDES for testing in an outbreak setting.

C. Specimen Collection

Isolates should be submitted to PHL on media that support its growth. In the event of an outbreak, contact CDES for assistance in determining which additional specimens should be collected for laboratory study. Include the DOH Reference Bacteriology form http://www.doh.wa.gov/EHSPHL/PHL/Forms/ReferenceBacteriology.pdf with all specimens.

5. ROUTINE CASE INVESTIGATION

Interview the case and others who may be able to provide pertinent information.

A. Evaluate the Diagnosis

Determine the clinical presentation (e.g., septicemia, meningitis), onset date and risk factors (e.g., pregnant, immunocompromised, neonatal). Encourage laboratories to submit isolates to PHL to assist with outbreak detection.

B. Identify Source of Infection

Ask about the following exposures in the 3–70 days prior to onset:

1. Consumption of unpasteurized milk or unpasteurized dairy products (e.g., soft cheeses made with raw milk)

2. Consumption of prepackaged, ready-to-eat meat (e.g., hot dogs, turkey, bologna)

3. Consumption of refrigerated, prepared foods, or any foods from a deli
4. Consumption of dried, preserved or traditionally prepared meats (e.g., sausage, salami, jerky) or preserved, smoked, or traditionally prepared fish
5. Contact with animals or animal products
6. Exposures to soil

C. Environmental Evaluation

An environmental evaluation is usually not needed since the source of the infection is rarely determined with certainty. Contact CDES if you have high suspicion for a source of infection.

6. CONTROLLING FURTHER SPREAD

A. Infection Control Recommendations

1. Hospitalized patients should be treated using standard precautions.
2. To prevent the possible spread in nurseries, strict hand washing by personnel should be enforced.
3. Food handlers, child care providers, and health care personnel with diarrhea should be excluded from work while symptomatic; however, no specific measures are needed to prevent or control transmission from asymptomatic *Listeria* carriers.

B. Case Management

No further case follow-up needed after infection control recommendations made.

C. Contact Management

With the exception of mother-to-fetus/newborn, person-to-person transmission of listeriosis is rare.

D. Environmental Measures

Regulatory agencies (e.g., Washington State Department of Agriculture) enforce U.S. laws prohibiting the presence of *L. monocytogenes* in ready-to-eat foods. In outbreak situations, implicated food products will be recalled.

7. MANAGING SPECIAL SITUATIONS

A. Outbreaks

Although rare, listeriosis outbreaks are important to identify and investigate because of the life-threatening nature of the disease and the likelihood that there is a continuing common source of infection in the community. Such investigations are difficult, require special questionnaires and active surveillance, and may involve complex environmental evaluations. Consultation with CDES is essential before beginning any special investigation.

8. ROUTINE PREVENTION

A. Vaccine Recommendations: None

B. Prevention Recommendations

(available at: http://www.cdc.gov/ncidod/dbmd/diseaseinfo/listeriosis_g.htm#reducerisk)

1. General recommendations:
    - Thoroughly cook raw food from animal sources, such as beef, pork, or poultry.
    - Wash raw vegetables thoroughly before eating.
    - Keep uncooked meats separate from vegetables and from cooked foods and ready-to-eat foods.
    - Avoid unpasteurized (raw) milk or foods made from unpasteurized milk.
    - Wash hands, knives, and cutting boards after handling uncooked foods.
    - Consume perishable and ready-to-eat foods as soon as possible.
2. Recommendations for persons at high risk, such as pregnant women and persons with weakened immune systems, in addition to the recommendations listed above:
    - Do not eat hot dogs, luncheon meats, or deli meats, unless they are reheated until steaming hot.
    - Avoid leftover foods or ready-to-eat foods from delicatessen counters, unless heated/reheated to steaming hot before eating.
    - Avoid getting fluid from hot dog packages on other foods, utensils, and food preparation surfaces, and wash hands after handling hot dogs, luncheon meats, and deli meats.
    - Do not eat soft cheeses such as feta, Brie, and Camembert, blue-veined cheeses, or Mexican-style cheeses such as queso blanco, queso fresco, and Panela, unless they have labels that clearly state they are made from pasteurized milk.
    - Do not eat refrigerated pâtés or meat spreads. Canned or shelf-stable pâtés and meat spreads may be eaten.
    - Do not eat refrigerated smoked seafood, unless it is contained in a cooked dish, such as a casserole. Refrigerated smoked seafood, such as salmon, trout, whitefish, cod, tuna or mackerel, is most often labeled as "nova-style," "lox," "kippered," "smoked," or "jerky." The fish is found in the refrigerator section or sold at deli counters of grocery stores and delicatessens. Canned or shelf-stable smoked seafood may be eaten.

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UPDATES